It is impossible to discuss workloads that can benefit from the zEnterprise System without including the traditional mainframe workloads. The innovations in the z196 continue IBM's long-standing history of continuous improvements in mainframe processing. IBM's well-known transaction processing systems, such as CICS and IMS, can handle even greater volumes with the additional capabilities that the z196 provides.

There are software solutions that leverage z/OS capabilities to enhance SOA architectures and provide significant improvements for Java programs. With z/OS, z/TPF, z/VSE, z/VM, and Linux on System z, there are plenty of opportunities to create powerful application solutions.

When you consider how to deploy multitier applications, keep in mind that they can leverage the unmatched reliability and security of the zEnterprise 196. The z196 is ideal for data and transaction serving for mission-critical applications.

The introduction of the zBX means that new and existing workloads will be running on the zEnterprise System. Here's an outline a few types of applications that can benefit from this new environment.

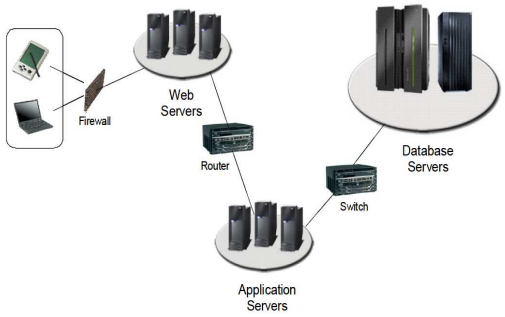
World Wide Web application - a three-tier architecture

One deployment model that has become common with the explosive growth of the World Wide Web is a three-tier web server application. This commonly involves an http server to present web pages to the users and accept their input. The http server identifies the application function requested by the user and sends the request to the next tier, the application server.

The application server will accept the request from the http server, select the appropriate business logic, and begin processing the request. This may imply calling upon business logic implemented in CICS or IMS, or even externally through web services. When the application server needs to retrieve data to supply the user's request, or when it needs to store the information provided by the user, it calls on a database server.

The database server maintains the organized data structures required by the application and invokes the necessary storage (disk) requests to retrieve or store data as requested by the application server.

This three-tier architecture is often deployed with the http server outside a firewall to protect the customer's network from unwanted intrusions from the public Internet. The http server may be implemented on multiple servers to insure sufficient capacity for a large volume of requests and to maintain availability. The http server then communicates through the firewall to the application servers.



An example three-tier application architecture implementation

The application servers, likely are implemented as a cluster, communicate with the database server and that data flow might be encrypted or flow through another firewall, depending on data sensitivity and industry or government privacy regulations.

This application architecture may benefit significantly from being deployed across a zEnterprise System. For example, the http server can be virtualized and deployed across several blades in the zBX. The public "Internet" communications could be isolated across one VLAN in the intra ensemble data network (IEDN)[‡] to which no other virtual servers are allowed access. VLAN isolation is considered to be as secure as physical isolation by many networking industry groups.

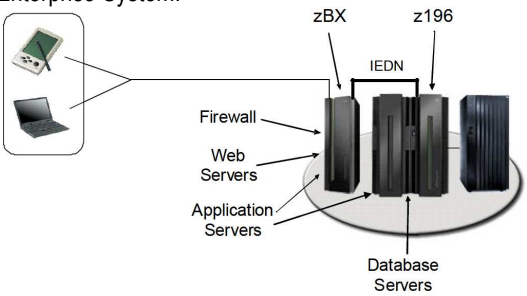
‡ IEDN is a private and secure high speed 10GbE data path between the z196 and the zBX, and the other members of a zEnterprise ensemble (see #64 zTidBits).

The internal ("intranet") communications could then be directed to the application server cluster deployed in the zBX blades or z196 (z/OS or Linux on System z under z/VM) through a separate VLAN.

Lastly, the application server's communications with the database server, which might be a DB2 for z/OS running in the z196, also flow over the IEDN. Because the IEDN is privately managed in the zEnterprise ensemble and may be configured without physical connections between the servers that might be compromised, the application server and database communications are highly secure.

This illustrates how this could be implemented with the zEnterprise System.

This presents a very cost effective and simplified 3 tier architecture configurable on zEnterprise where virtualization, administration, and performance management are all centrally located



Because the zEnterprise System is built with virtualization as a central theme, it presents an attractive solution for server consolidation. This is a topic of current interest in many data centers. The past years of adding multiple distributed server platforms for every new application has created "server sprawl" which has contributed to power, cooling, and floorspace problems in many data centers. With so many separate servers running at very low average utilization rates, a tremendous opportunity exists to consolidate servers onto fewer hardware instances through virtualization.

Grid-like cooperative processing architectures

The evolution of information processing solutions has grown to include special purpose environments, tailored to perform some tasks very efficiently. One example in this category is the IBM Smart Analytics Optimizer. The IBM Smart Analytics Optimizer is delivered as a packaged solution that installs directly in the zBX (see #64 zTidBits – bottom right). It provides a number of blades that are managed as a query processor for DB2 for z/OS. With appropriate software features installed, DB2 can use the IBM Smart Analytics Optimizer as an optimizer to build large data structures that can be queried very quickly, in parallel, to produce results much faster than traditional DB2 queries might perform.

Another example might be a high performance grid. In the grid concept, numerous independent but coordinated processors are given part of a complex task and allowed to proceed through the necessary calculations independently. After all the components have completed, the coordinator assembles the final result and returns it to the requestor. An application of this technology might involve investment portfolio analysis that provides recommendations for future investments based on recent market trends. Another such application is used in biomedical research where the search for possible medicines and vaccines involves the testing of so many combinations that linear processing simply would not complete in a feasible timeframe. Such grid implementations can sometimes take advantage of the computing capacity that is built for peak periods and apply it to streamlining other processes during off-peak times.

Take Full Advantage

The features of the zEnterprise System are designed to take full advantage of the resources available to meet your business needs. System z operating systems have a history of managing disparate work within a single system using a set of business objectives. This workload management is the inspiration for the similar functions included in the Unified Resource Manager suites, (see #65 zTidBits (Unified Resource Manager)).

The Performance Management component includes the same kind of workload classification rules to define class of work by hostname, the virtual server's name, or other criteria. By applying these classification rules to different workloads running under the same hypervisor, the Performance Management component can help allocate resources. When a more important workload needs more processor resource, the entitlement to CPU resources can be altered to move the available resources to the most important workload. With this kind of management capability, server consolidation becomes a strategy that can improve more than simply the hardware costs of your servers; it can make your workload perform better with fewer resources.

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